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09-101,612

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Signed

*Anastasius*

Dated

*19th February 1997*



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9600519.4

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By virtue of a direction given under Section 30 of the Patents Act 1977, the application is proceeding in the name of ~~name of~~ Road  
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Switchboard  
01633-814000

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## Patents Form 1/77

(Patents Act 1977  
rule 16)11JAN96 E166844-1 D02396  
P01/7700 25.00

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1. Your reference

6712:ME

2. Patent application number

(The Patent Office will fill in this part)

11 JAN 1996

9600519.4

3. Full name, address and postcode of the or of each applicant (underline all surnames)

GUY EDWARD JOHN MARGETSON  
BODO METSCHER  
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NR. DIDCOT, OXON OX11 5EB, RESPECTIVELY

4. Title of the invention

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VISUAL INFORMATION SYSTEMS

5. Name of your agent (if you have one)

SAUNDERS & DOLLEYMORE  
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WD1 7HE

Patents ADP number (if you know it)

1455001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country      Priority application number  
(if you know it)      Date of filing  
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application      Date of filing  
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

NO

- a) any applicant named in part 3 is not an inventor, or
- b) there is an inventor who is not named as an applicant, or
- c) any named applicant is a corporate body.

See note (d))

## Patents Form 1/77

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Continuation sheets of this form

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Description

4

Claim(s)

2

Abstract

1

Drawing(s)

2

11/1/96

10. If you are also filing any of the following, state how many against each item.

Priority documents

0

Translations of priority documents

0

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

0

Request for preliminary examination and search (Patents Form 9/77)

1

Request for substantive examination (Patents Form 10/77)

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Any other documents (please specify)

0

11.

I/We request the grant of a patent on the basis of this application.

Signature

Date

SAUNDERS &amp; DOLLEYMORE

11 JANUARY 1996

12. Name and daytime telephone number of person to contact in the United Kingdom

MIKE ENSKAT

01923 238311

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DUPLICATE

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VISUAL INFORMATION SYSTEMS

The present invention relates to visual information systems.

Advertising is often presented in illuminated form consisting of an array of fluorescent lights. Such lights are usually switched on during the hours of darkness. The array occupies the same area as the image presented and consumes relatively large amounts of energy. Such systems are relatively inflexible in as much as the whole array needs to be rebuilt to display another image.

Other arrays of moving images are known in which an array consisting of a plurality of rows and columns of light sources are individually energisable to produce, for example, a moving message. Such arrays have several times more columns of light source than rows. Also, the size of the array is the same size as the image and consequently the wiring of individual light sources to the controlling circuitry and the complexity of the control circuitry are likely to be very costly.

It is an object of the invention to provide an improved visual information system.

According to the present invention there is provided a visual information system comprising an array consisting of a plurality of individually and selectively energisable light sources arranged in rows and columns, a memory for storing a program representative of a predetermined image, a controller actuatable to control the selection and sequence of energisation of the light sources within a predetermined time span in accordance with the predetermined program stored on the memory so that a viewer observing the array and being carried past the array at a predetermined speed will observe immediately following said predetermined time span the said predetermined image as an apparently stationary image occupying an area substantially larger than the area of

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said array.

A visual information system embodying the invention will now be described, with reference to the accompanying diagrammatic drawings, in which:

5

Figure 1 is a front elevation of the system;

Figure 2 is a block diagram of the system; and

Figure 3 is a more detailed block diagram of the system.

10

The visual information system to be described is arranged to be located in tunnels through which public transportation vehicles such as tube trains normally run. The system consists of a series of light source arrays 2 arranged at spaced intervals along the track 4 on the side wall of the tunnel, generally level with the windows of the train so that the arrays can be viewed by the passengers in the train. A sensor 6 located upstream of each array 2 is responsive to the approach of the train to the array to actuate the array. Another sensor 8 located downstream of each array is responsive to when the train has passed to deactivate the array 2. The sensors 6 and 8 may take the form of infrared transmitter and receiver pairs.

15

Each array 2 consists of four columns and sixty four rows of individually and selectively energisable light sources for example light emitting diodes.

20

Selected light sources in the array are switched ON and OFF by a controller 10 in accordance with a predetermined program stored in a memory 12. The controller is triggered by the sensor 6 and the program is cyclically repeated until a signal is received from the sensor 8.

25

The switching rate of the light sources and the duration of their energisation is such that a passenger sitting in the train and keeping his eyes directed at the array will observe an image several times wider than the

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width of the array.

5 The effect is achieved because with light flashes of very short duration, the reaction of the human eye to the flash persists long after the flash has finished. Thus, where a series of very short flashes occur over a short time span less than 0.015 seconds, all the flashes appear to the eye to have occurred at the same time and when the flashes are spaced from one another on the retina because the viewer has moved relative to the array, the eye perceives a composite light pattern which will persist for a short while immediately following the time span. It will thus be appreciated that a program can be created and stored in the memory 12 which will produce almost any desired image for the observer. The image may 10 take the form of alpha numeric information or may take the form of an advertising poster.

15

The block diagram of the system is more clearly shown in Figure 3.

20 As can be seen, the array 2 consists of a series of light emitting diodes 20. In this arrangement only sixteen are shown, arranged in a single column. Each LED has a power output of 32 mcd's and has a high switching speed with a switching time faster than 10 nanoseconds.

25 The controller 10 includes a driver 22 which acts to drive the LED's 20 through respective resistors 24. The driver 22 is controlled by a central processing unit (CPU) 26 which derives its instructions from terminal 1 of the memory 12 via resistors R36 and R34 which feed terminal 5 of the CPU. The memory 12 is in the form of an 30 erasable programmable read only memory (EPROM).

The CPU 26 is triggered into action by a signal received on terminal 28 from the sensor 6.

35 The CPU cyclically repeats the program stored in the EPROM 12 at a repetition rate in the range of from 10-50 Hz but is preferably 15 Hz.

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By updating the memory periodically the passengers will be able to observe different images.

When a large plurality of arrays are provided they can be divided into groups with the memory of the system in each group being updatable simultaneously. A central computer (not shown) is provided to store a plurality of different programs. The central computer is connected to each group to update the memory in each group with a new program depending either upon the time of day or the location of the group.

When a colour image is required, each light source of the array can be replaced by a row consisting of red, green and blue elements or a row consisting of red, green, blue and white light elements. Each element is selectively energisable. It will be appreciated that by having the program determine, the period of energisation of each light source, the shade of colour in the final image can be varied as required.

While the rows and columns in each memory can be varied, it is preferable that the ratio of rows to columns in the array is 16:1 or greater.

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CLAIMS

1. A visual information system comprising an array consisting of a plurality of individually and selectively energisable light sources arranged in rows and columns, a memory for storing a program representative of a predetermined image, a controller actuatable to control the selection and sequence of energisation of the light sources within a predetermined time span in accordance with the predetermined program stored on the memory so that a viewer observing the array and being carried past the array at a predetermined speed will observe immediately following said predetermined time span the said predetermined image as an apparently stationary image occupying an area substantially larger than the area of said array.
2. A system according to Claim 1, including sensing means for monitoring the passage of a carrier carrying said viewer past the array to trigger said controller into action.
3. A system according to Claim 2, wherein said sensing means comprises infrared sensing means arranged to activate said controller upon the approach of said carrier to the array and to deactivate the controller upon the departure of said carrier away from said array.
4. A system according to Claim 3, wherein the sensing means comprises a first infrared transmitter and receiver pair located upstream of the array and a second infrared and transmitter pair located downstream of the array.
5. A system according to any preceding claim, wherein the controller is arranged to cyclically repeat the energisations specified by the predetermined program at regular intervals.
6. A system according to any preceding claim, wherein the array consists of light sources of different colours

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and wherein the predetermined program specifies different durations of energisation of the different coloured light sources.

7. A system according any preceding claim, wherein said controller is arranged to complete one cycle of the predetermined program within a period of 0.015 seconds.

5 8. A system according to any preceding claim, wherein the ratio of rows to columns in the array is 16:1 or greater.

10 9. A system according to Claim 1, wherein each light source comprises a light emitting diode and the controller includes a driver for driving each light emitting diode, the driver being arranged to vary the period for which its corresponding diode is energised in accordance with the program stored in the memory.

15 10. An arrangement comprising a plurality of systems each according to any preceding claim and a main computer arranged to store a plurality of different programs each representing a respective image, said main computer being operable to replace the program stored in said memories with a program stored in said main computer.

20 11. An arrangement according to Claim 10, wherein said main computer is programmed to replace the program stored in selected ones of the memories in accordance with the time of day.

25 12. An arrangement according to Claim 10 or Claim 11, wherein the computer is programmed to replace the program stored in selected ones of the memories in accordance with the location of their associated arrays.

30 13. A visual information system substantially as hereinbefore described, with reference to the accompanying drawings.

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ABSTRACTVISUAL INFORMATION SYSTEMS

A visual information system includes an array (2) of light emitting elements located at the side of a train track (4). The elements are individually energisable by a controller (10) in response to a predetermined program stored in a memory (12) and representative of a predetermined visual image. The controller (10) causes selected elements to be turned ON and OFF, some repetitively, in a predetermined sequence as dictated by the program with a time span of 0.015 seconds. A sensor (6) activates the controller (10) upon the approach of a train so that a passenger gazing at the array (2) as the train passes will perceive the said image apparently extending over an area substantially greater than the area of said array (2).

20 (Figure 1)

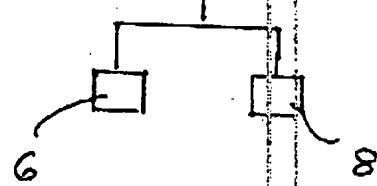
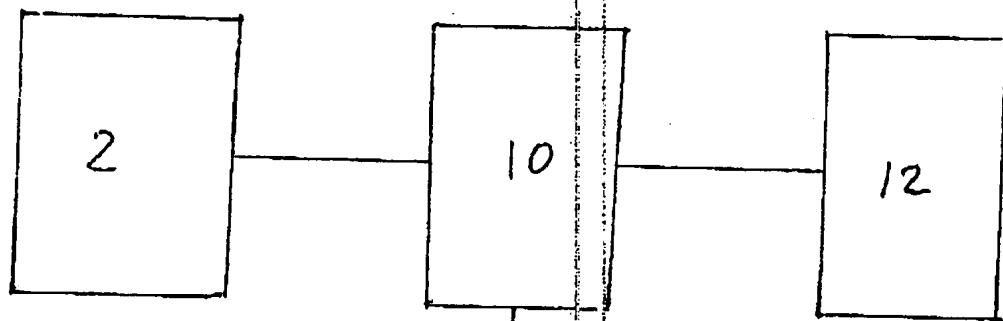
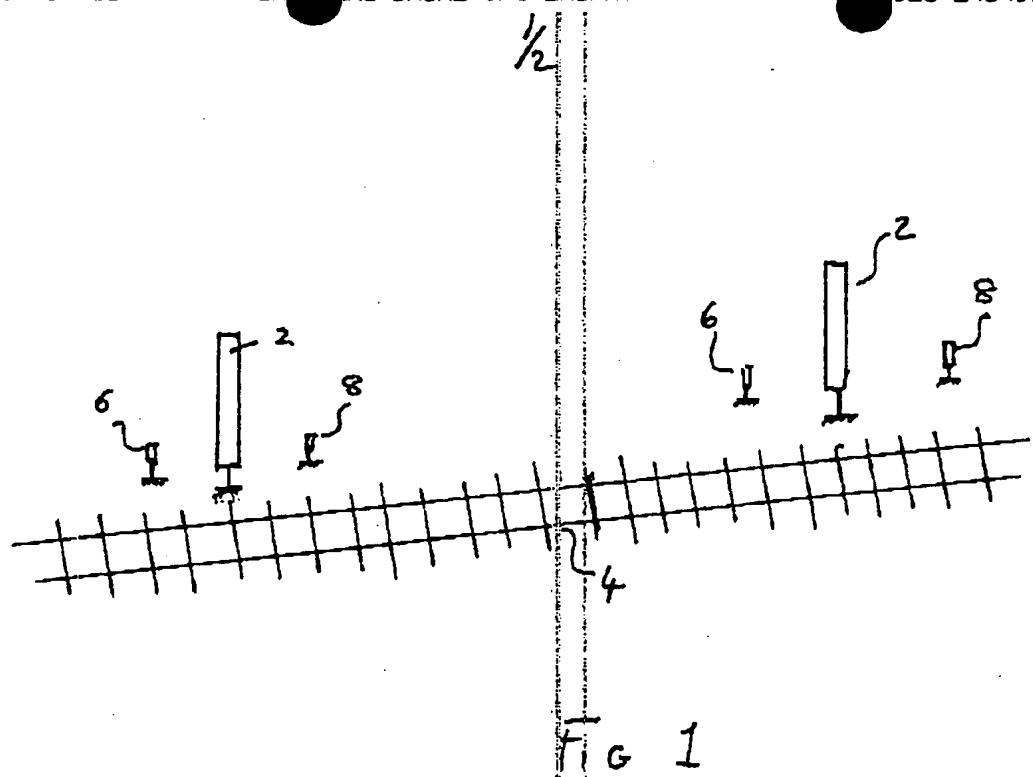


Fig 2

NOT TO

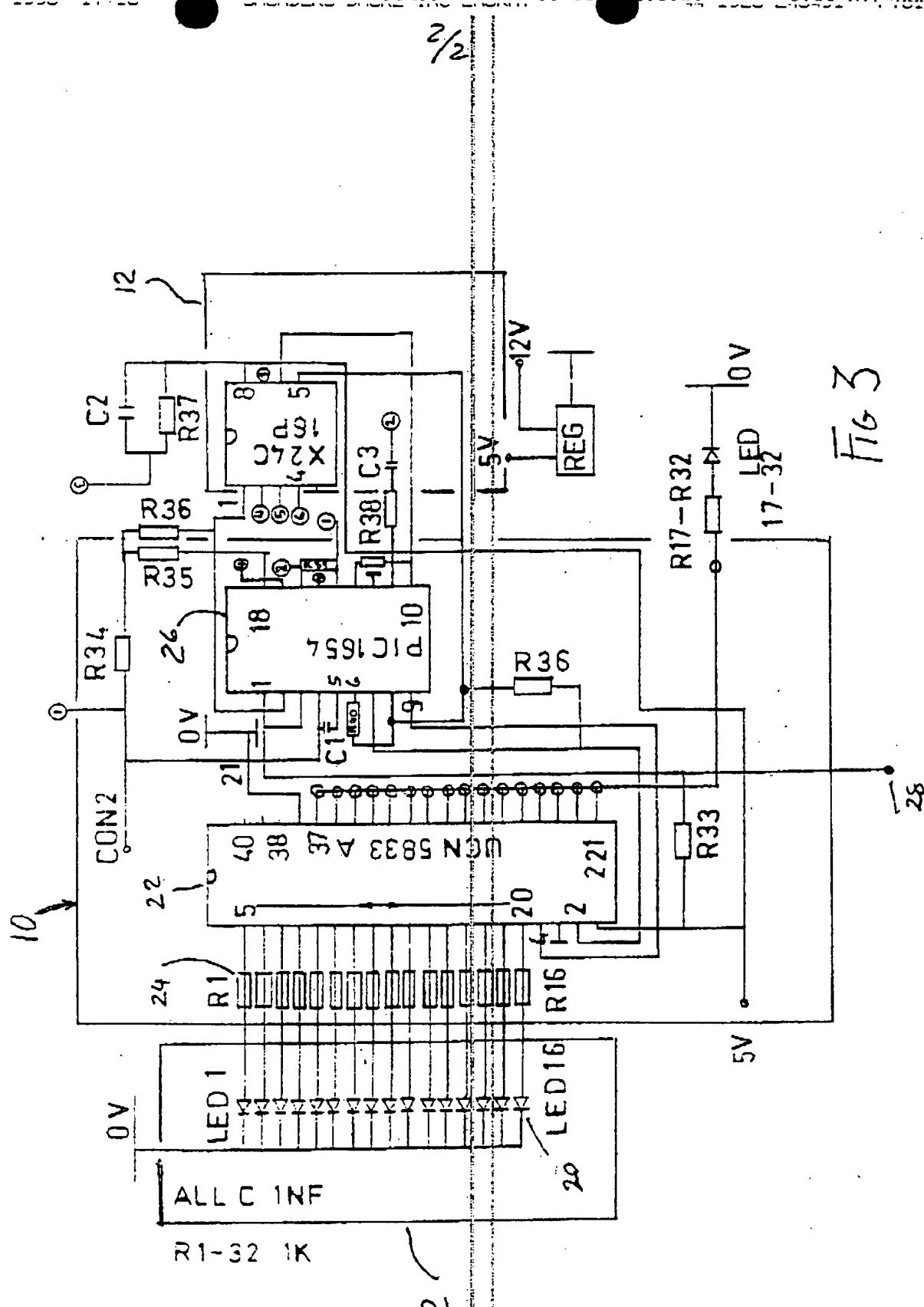


Fig 3

NOT TO BE AMENDED

# INTERNATIONAL SEARCH REPORT

International Application No  
PC1/GB 97/00096

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 G09F19/22

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 G09F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 24 61 140 B (A. WEINGARTNER) 4 December 1975 see the whole document ---	1-15
A	EP 0 390 749 A (INNOVAZIONE) 3 October 1990 see the whole document ---	1-15
A	GB 2 241 813 A (G. HELCKE) 11 September 1991 see the whole document -----	1-15

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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2

Date of the actual completion of the international search  3 April 1997	Date of mailing of the international search report  09.04.97
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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

Inte  
nal Application No  
PCT/GB 97/00096

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 2461140 B	04-12-75	DE 2461140 A	04-12-75
EP 390749 A	03-10-90	NONE	
GB 2241813 A	11-09-91	NONE	

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